Summary of Beth Sanderson's presentation:

Identify population structure in Puget Sound

- What is a population?
- How do we identify a population?
- Why it's important?

Population

A population is a group of fish of the same species spawning in a particular lake or stream at a particular season which to a substantial degree do not interbreed with fish from any other group

this means that two groups will be considered to be separate populations if they are isolated to such an extent that exchanges of individuals among the populations do not appreciably affect the population dynamics or extinction risk of the independent populations over a 100-year time frame

Viable salmonid populations and the recovery of evolutionarily significant units (in prep)

Scales of Management Decisions in Puget Sound

- harvest management units
- SASSI stocks

Stock	1992	1993	1994	1995	1996	1997	
A	10	20	13	8	11	9	Separate populations
B	12	4	13	12	9	5	
C	32	18	15	44	22	37	
A	10	20	13	8	11	9	One Population
B	12	4	13	12	9	5	
C	32	18	15	44	22	37	

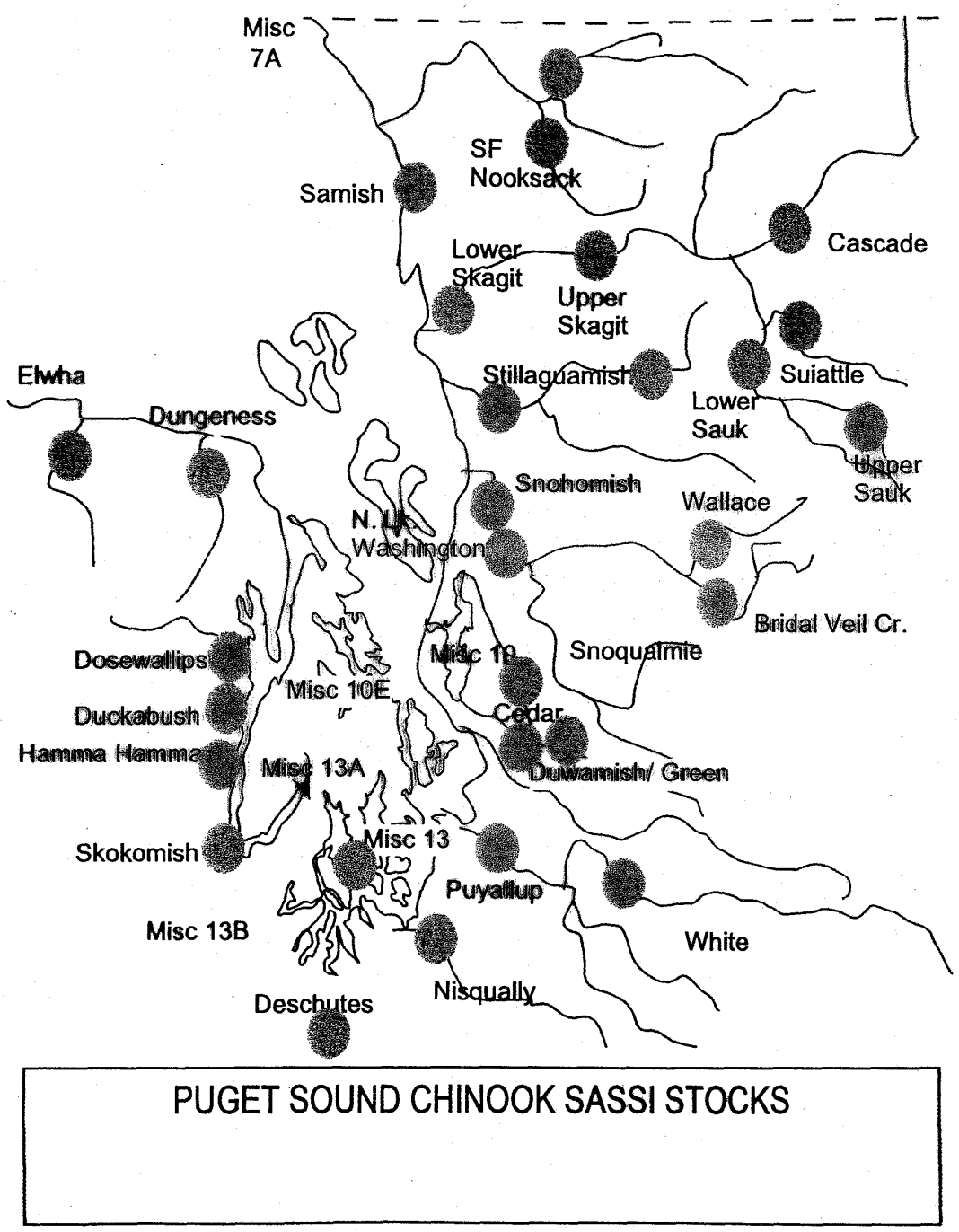
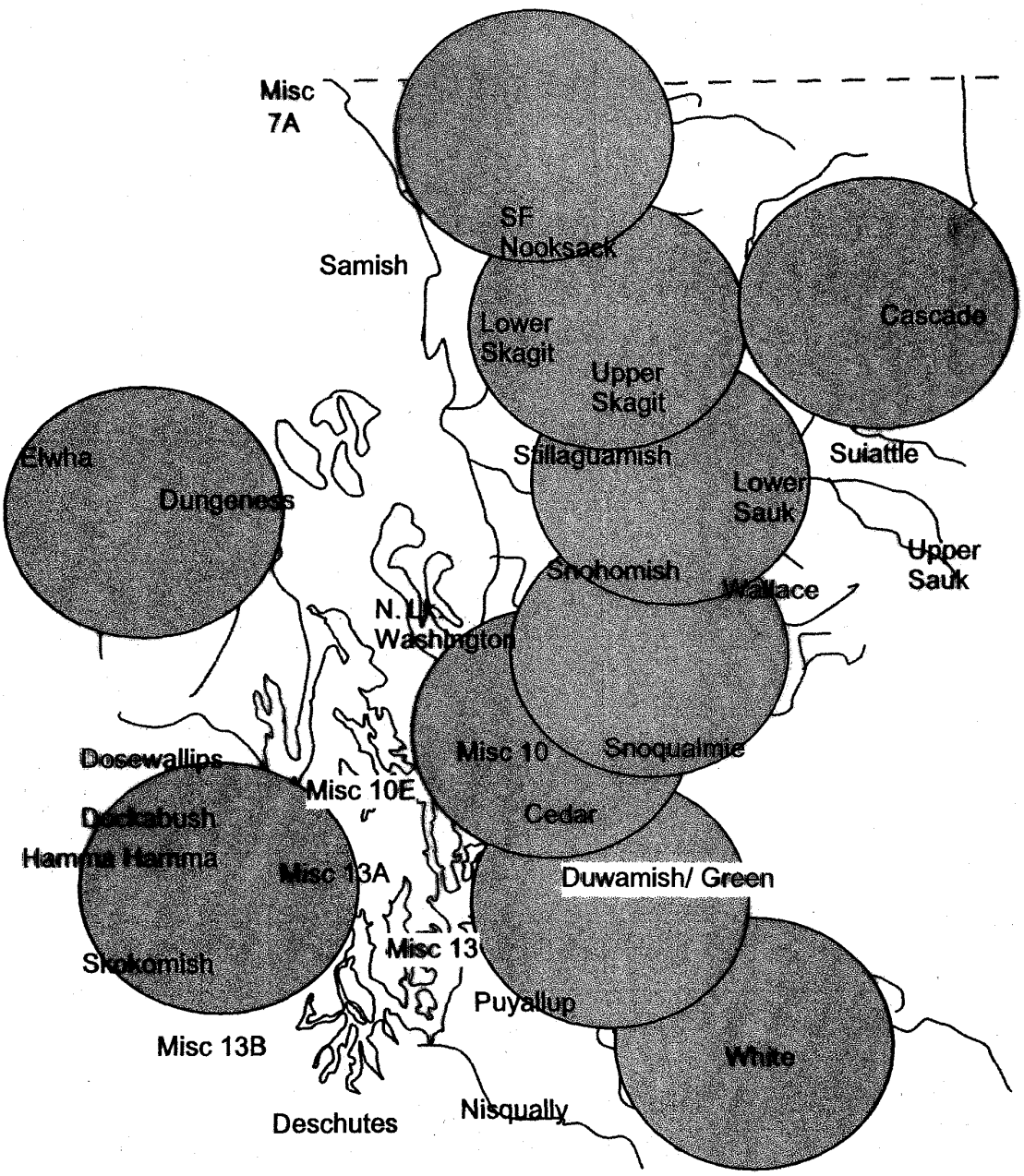


Figure 1-SASSI Stocks



CLASSIFICATION OF PUGET SOUND CHINOOK STOCKS
harvest management units

Figure 2-Harvest Management Unit

How do different characterizations of population structure affect population viability estimates?

Methods:

1. Data (chinook abundance time series from Puget Sound streams (source: WDFW, tribes)

- **Group stream population data based on existing management units**
  - **State/tribal harvest management units**
  - **SASSI stocks**
- **Use simple extinction model to estimate relative quasi-extinction risks for different stream groupings**

Important Parameters in the Dennis et al. model (1991)

Population size
Variance
Population growth rate

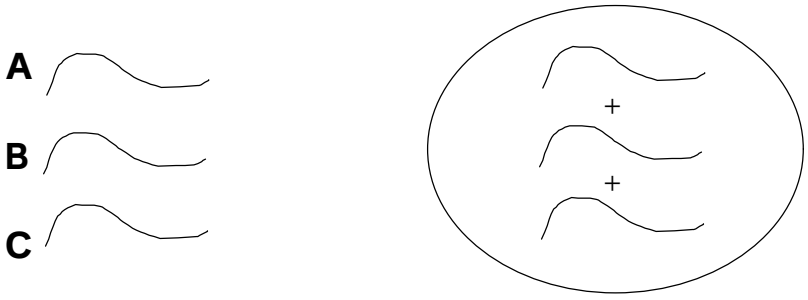
quasi-extinction =
1 fish / year over a 100 year time period

How do different characterizations of population structure affect population viability estimates?

- **scale of management?**

Individual (SASSI stocks)

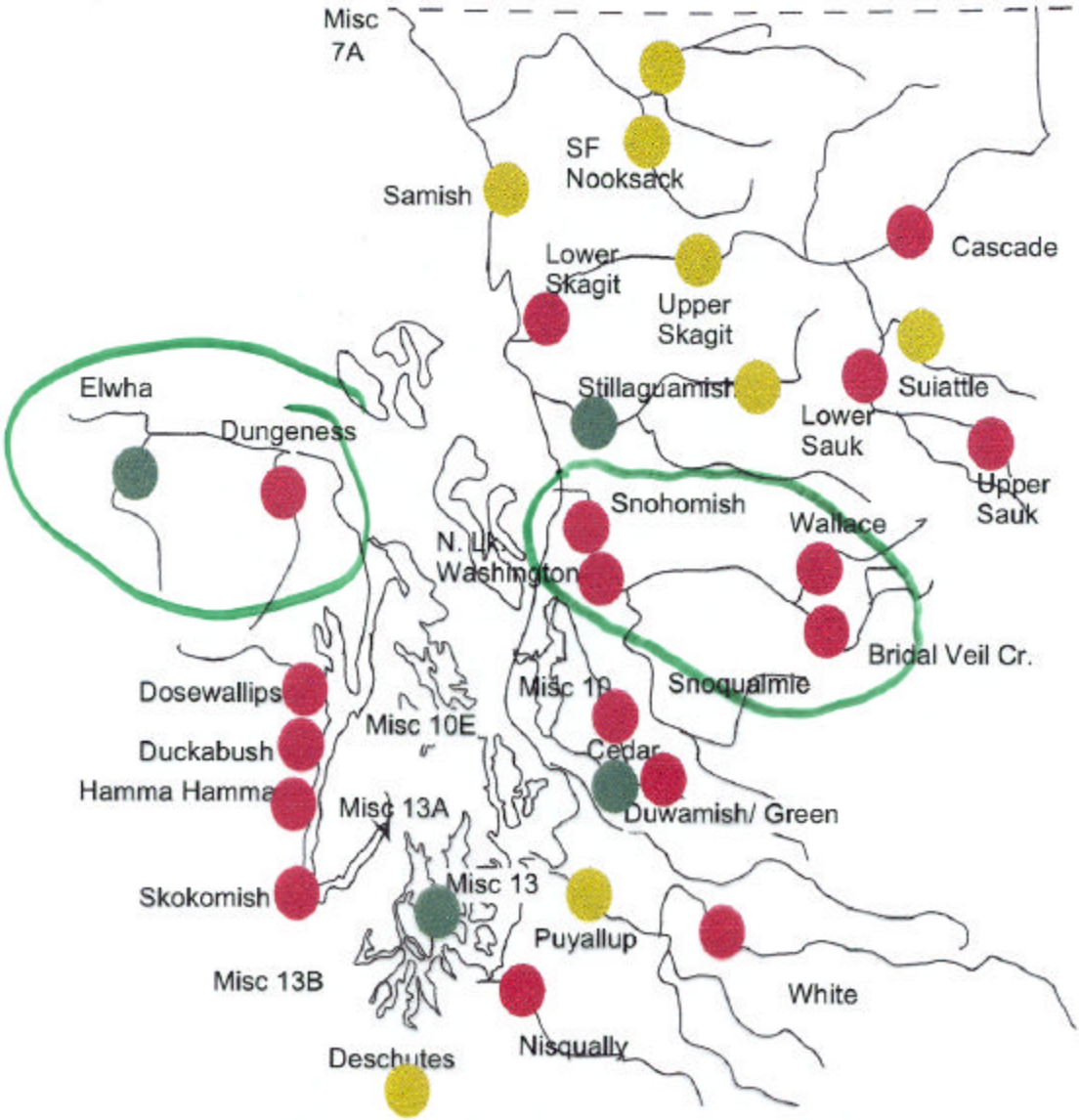
Combined (Harvest Unit)



Points to remember

-quasi-extinction probabilities

-relative change in quasi-extinction risks



CLASSIFICATION OF PUGET SOUND CHINOOK STOCKS
Quasi-extinction probabilities of
SASSI stocks

Figure 3 – SASSI Stock Extinction Risks

Red – high risk

Yellow – medium risk

Green – low risk

Examples:

- Elwha-Dungeness
- Snohomish

What happens when we group these? See Figure 4

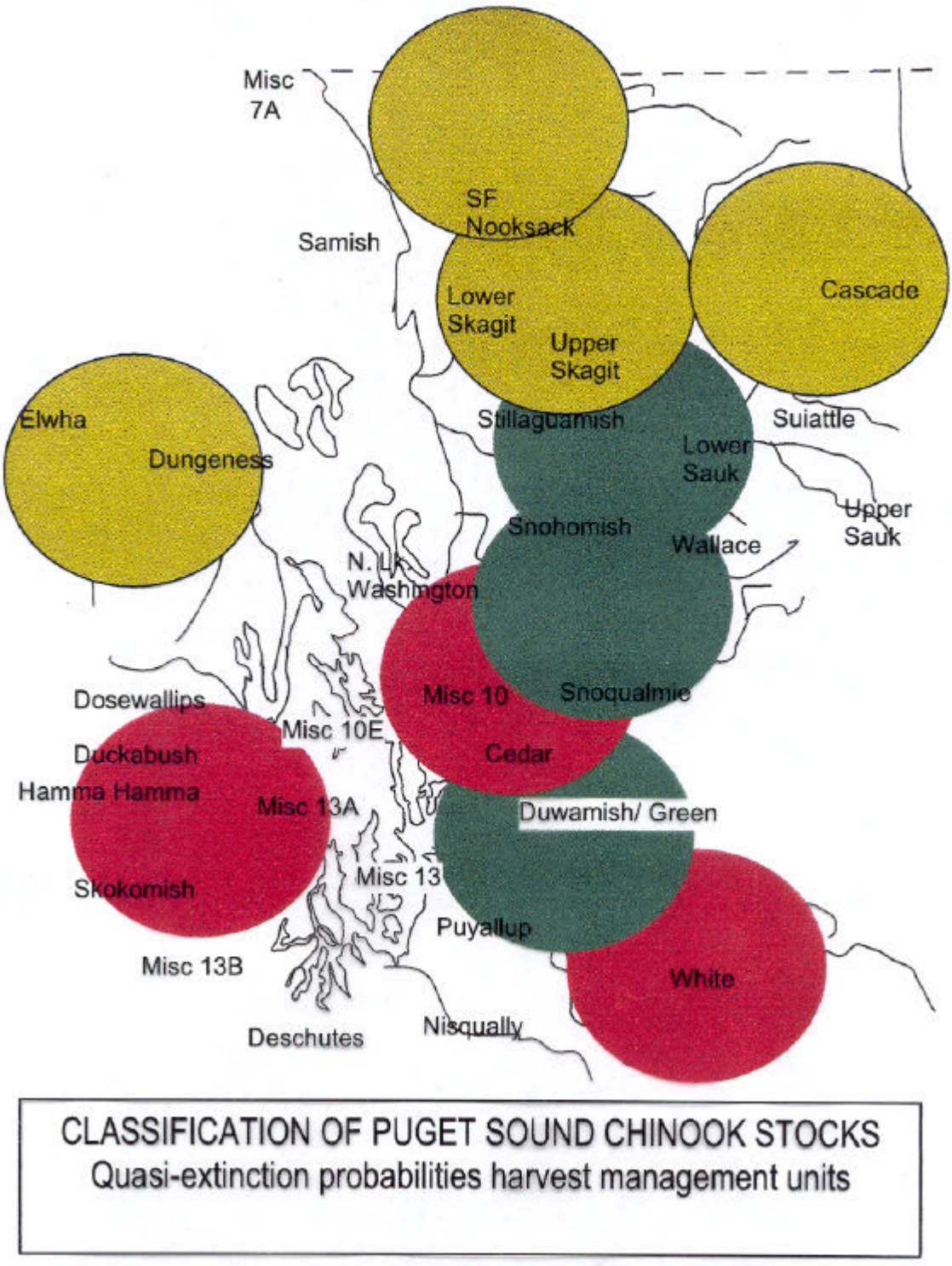
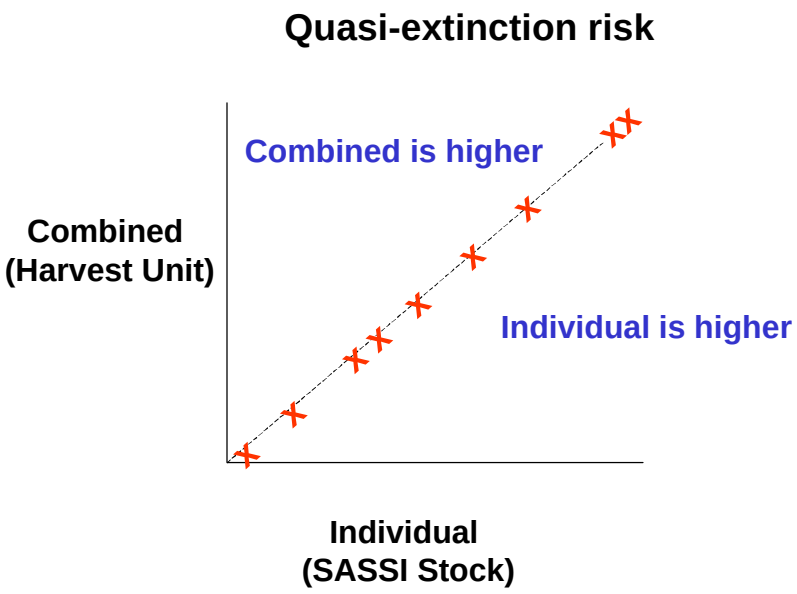


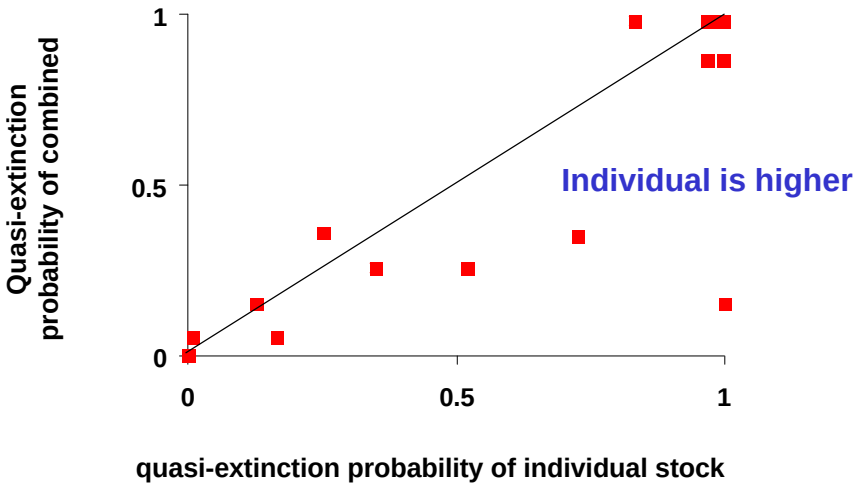
Figure 4 – Harvest Units
Red – high risk
Yellow – medium risk
Green – low risk

Examples:

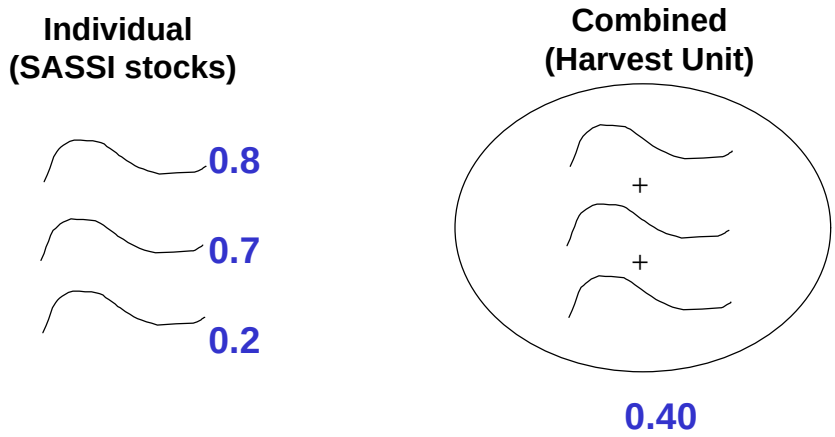
- Elwha-Dungeness
- Hood Canal
- Snohomish



Effect of stream grouping on quasi-extinction risk



What if we assume individual stocks in harvest management units are independent from one another?



How do different characterizations of population structure affect population viability estimates?

- **scale of management?**

  too big?
  - **lose individual populations**
  - **overestimate risks for independent populations**

  too small?
  - **too much gloom and doom**

How do different characterizations of population structure affect population viability estimates?

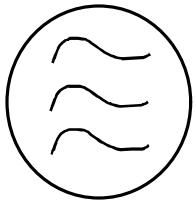
- **scale of management?**

  too big?
  - **lose individual populations**
  - **overestimate risks for independent populations**

  too small?
  - **too much gloom and doom**

- **how do we collect information?**
  - **geographic coverage**
  - **length of time series**

How does having data from one less stream affect our estimate of quasi-extinction probability?



How often was quasi-extinction risk greater?

5 **(8)** **14**

How does having shorter time series affect our estimate of quasi-extinction probability?

time

time

How often was quasi-extinction risk greater?

4 **15**

How do different characterizations of population structure affect population viability estimates?

- scale of management?
  - too big?
    - lose individual populations
    - overestimate risks for independent populations
  - too small?
    - too much gloom and doom
- how do we collect information?
  - viability estimates were generally more optimistic when more data were available, both in space and time

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Bottom Line

Knowing the population structure within Puget Sound is really important!

- if management scale is too big
  lose individual populations
  overestimate risks of individual populations

- if management scale is too small
  doom, gloom and depression

- how we collect information really matters